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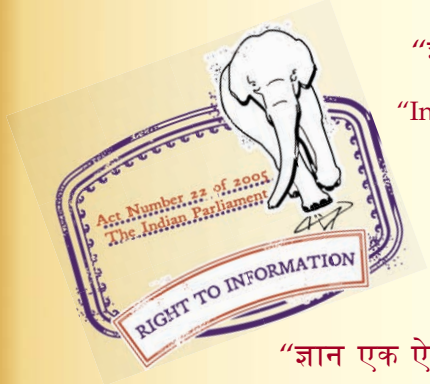
IS 11654-3-407 (1989): Flexible insulating sleeving, Part 3: Specifications for individual type of sleevings, Section 407: Glass textile sleeving with PVC based coating medium breakdown strength [ETD 2: Solid Electrical Insulating Materials and Insulation Systems]



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IS 11654 (Part 3/Sec 407) : 1989

Indian Standard (Reaffirmed 2005)

SPECIFICATION FOR FLEXIBLE INSULATING SLEEVING

PART 3 SPECIFICATIONS FOR INDIVIDUAL TYPES OF SLEEVINGS

Section 407 Glass Textile Sleeving with PVC Based Coating — Medium Breakdown Strength

भारतीय मानक

नम्य विद्युतरोधन स्लीविंगों की विशिष्टि

भाग 3 अलग-अलग स्लीविंग

अनुभाग 407 पी वी सी आधारित लेपनयुक्त मध्यम भंजन सामर्थ्य वाली कांच-वस्त्रादि की स्लीविंग

UDC 621·315·614·73-462

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1990 **Price Group 2**

FOREWORD

This Indian Standard (Part 3/Sec 407) was adopted by the Bureau of Indian Standards on 16 October 1989, after the draft finalized by the Solid Electrical Insulating Materials Sectional Committee had been approved by the Electrotechnical Division Council.

This standard deals with flexible insulating sleevings. It consists of the following three parts:

Part 1 Definitions and general requirements,

Part 2 Methods of tests, and

Part 3 Specifications for individual types of sleevings.

This standard covers the requirements for glass textile sleeving with PVC based coating medium breakdown strength.

This standard should be read in conjunction with IS 11654 (Part 1) : 1986 'Specification for flexible insulating sleeving: Part 1 Definitions and general requirements', and IS 11654 (Part 2) : 1986 'Specification for flexible insulating sleeving: Part 2 Methods of test'.

In the preparation of this standard, assistance has been derived from IEC Doc : 15C (Central Office) 199, Sheet 407 Glass textile sleeving with PVC based coating medium breakdown strength.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SPECIFICATION FOR FLEXIBLE INSULATING SLEEVING

PART 3 SPECIFICATIONS FOR INDIVIDUAL TYPES OF SLEEVINGS

Section 407 Glass Textile Sleeving with PVC Based Coating — Medium Breakdown Strength

1 SCOPE

1.1 This standard covers the requirements for Class E glass sleeving using either braided or knitted construction coated with a continuous flexible coating based on polyvinyl chloride (PVC) or its copolymers or blends thereof medium breakdown strength.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
IS 8504 (Part 1) : 1977	Guide for determination of thermal endurance properties of electrical insulating materials : Part 1 Temperature indices and thermal endurance profiles
IS 10810 (Part 53) : 1984	Methods of test for cables: Part 53 Flammability test
IS 11654 (Part 1) : 1986	Specification for flexible insulating sleeving : Part 1 Definitions and general requirements
IS 11654 (Part 2) : 1986	Specification for flexible insulating sleeving : Part 2 Methods of test

3 DESIGNATION

3.1 Sleeving covered in this standard shall be identified as given in **3.1** of Part 1 of this standard.

For Example:

IS 11654-3-407 Nominal bore size in mm colour code.

NOTE — Colour code shall be as given in **3.2** of IS 11654 (Part 1) : 1986.

4 COLOUR

4.1 Sleeving is normally available in the colours : black, white, red, yellow, blue, green, brown and green/yellow.

5 REQUIREMENTS

5.1 In addition to the general requirements given in IS : 11654 (Part 1) : 1986, requirements specified in this standard shall also be applicable.

5.2 Dimensions

The sleeving shall comply with the dimensional requirements given in Table 1.

5.3 Bending After Heating

When tested in accordance with **13** of IS 11654 (Part 2) : 1986, there shall be no cracking or detachment of coating visible after bonding around mandrels as shown in Table 2 after 96 hours at 130°C.

5.4 Bending at Low Temperature

When tested in accordance with **14** of IS 11654 (Part 2) : 1986, there shall be no cracking or detachment of coating visible after bending around mandrel as shown in Table 2 while at −25°C.

5.5 Thermal Stability

When tested in accordance with Method 'A' given in **11** of IS 11654 (Part 2) : 1986, the indicator paper shall not show the change in colour in less than 20 minutes while at 200°C.

5.6 Resistance to Soldering Heat

When tested in accordance with **7** of IS 11654 (Part 2) : 1986, the sleeving shall not show sign of splitting.

NOTE — This test shall be applicable for sleeving having nominal bore dia up to and including 5 mm.

5.7 Thermal Endurance, TI

When tested in accordance with IS 8504 (Part 1) : 1977, minimum TI at 20 000 hours shall be 105.

Table 1 Dimensional Requirements

(*Clause* 5.2)

Nominal Bore mm	Tolerance on Bore mm		Wall Thickness mm	
	Bilateral	Unilateral	*Min*	*Max*
(1)	(2)	(3)	(4)	(5)
	(±)	(±)		
0·3	0·05	0·10	0·15	0·30
0·5	0·10	0·20	0·20	0·50
0·8	0·10	0·20	0·20	0·50
1·0	0·15	0·30	0·20	0·75
1·5	0·15	0·30	0·20	0·75
2·0	0·20	0·40	0·20	0·75
2·5	0·20	0·40	0·20	0·75
3·0	0·25	0·50	0·30	0·75
4·0	0·25	0·50	0·30	0·75
5·0	0·25	0·50	0·30	0·75
6·0	0·25	0·50	0·30	0·75
8·0	0·50	1·00	0·30	0·90
10·0	0·50	1·00	0·40	0·90
12·0	0·50	1·00	0·40	0·90
16·0	0·50	1·00	0·40	0·90
20·0	0·50	1·00	0·40	0·90
25·0	0·50	1·00	0·40	0·90

NOTE — Only positive tolerances may be used if agreed to between the purchaser and the supplier.

5.8 Flammability

When tested applying IS 10810 (Part 53) : 1984, in accordance with **27** of IS 11654 (Part 2) : 1986, flammability shall be minimum 60 seconds. In addition, the indicator flag on these tests shall not be burned-way and cotton shall not get ignited by flaming or glowing drippings.

Table 2 Mandrel Diameters for Bending Tests

(*Clauses* 5.3 *and* 5.4)

Nominal Bore mm	Mandrel Diameter, mm	
	After Heating	At Low Temperature
0·3	2	2
0·5	3	3
0·8	4	4
1·0	5	5
1·5	6	6
2·0	8	8
2·5	10	10
3	12	12
4	15	15
5	18	18
6	21	21
8	27	27
10	33	6
12	40	6
16	6	6
20	6	6
25	6	6

5.9 Breakdown Voltage

5.9.1 Breakdown voltage shall be determined by any of shot bath test given in **21.2** and straight mandrel test, 25 mm electrode given in **21.3** of IS 11654 (Part 2) : 1986.

5.9.2 The rate of voltage application shall be 500 V/second or such that the required breakdown value is reached between 10 and 20 seconds.

5.9.3 The requirements of breakdown voltage at room temperature elevated temperature and damp heat when measured in accordance with **21.7** of IS 11654 (Part 2) : 1986, shall be given in Table 3.

5.10 Insulation Resistance

5.10.1 *Insulation Resistance at Room Temperature*

When tested in accordance with **22** of IS 11654 (Part 2) : 1986, the insulation resistance shall be 10^2 MΩ (*Min*).

5.10.2 *Insulation Resistance After Damp Heat*

When tested in accordance with IS 11654 (Part 2) : 1986, the insulation resistance shall be 10^2 MΩ (*Min*).

5.11 Mould Growth

In case of agreement between the purchaser and the supplier mould growth shall be tested for Scale 1 in accordance with IS 11654 (Part 2) : 1986.

6 PACKAGING

6.1 Provisions of **9.1** of IS 11654 (Part 1) : 1986, shall apply.

7 MARKING

7.1 In addition to the details given in **10** of IS 11654 (Part 1) : 1986, following information shall be labelled:

Construction of the sleeving — braided or knitted.

Table 3 Requirements for Breakdown Voltage

(*Clause* 5.9.3)

	Shot Bath Test Using Straight Mandrel 250-mm Electrode		Straight Mandrel with 25-mm Electrode	
	Central Value (kV)	Lowest Individual Value (kV)	Central Value (kV)	Lowest Individual Value (kV)
Breakdown voltage kV (*Min*):				
a) At room temperature	3·0	2·5	4·0	2·5
b) At elevated temperature (130°C)	2·0	1·5	1·2	0·8
c) After damp heat	1·8	1·2	1·2	0·8

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